Remarks/Arguments:

Claims 1-10 are pending in the above-identified application. Claims 1, 6, 9 and 10 were rejected under 35 U.S.C. § 103(a) as being obvious in view of Grabb et al. and Limberg. This ground for rejection is respectfully traversed. In particular, neither Grabb et al., Limberg nor their combination disclose or suggest, "an amplitude detector coupled directly to the tuner to provide a measure of the amplitude of the tuned television signal prior to the demodulation of the tuned television signal," as required by claim 1 or "measuring the amplitude of the tuned television signal prior to the step of demodulating the tuned television signal," as required by claim 6.

In the Office Action, it is asserted that "[t]he claimed 'demodulator coupled to the tuner to demodulate the tuned television signal' is met by the NTSC Audio/Video Decoder 105 and Display Format 106," and that "[t]he claimed 'amplitude detector coupled directly to the tuner to provide a measure of the amplitude of the tuned television signal' is met by the Channel Measurement A/D 113 which is coupled directly to the tuner 103...."

Applicants respectfully disagree with these assertions. In particular, Applicants assert that the NTSC Tuner 103 of Grabb et al. includes a demodulator. This can be seen because the NTSC Tuner of Grabb et al. provides an AGC voltage signal. (See col. 3, lines 11-18). One of ordinary skill in the art of television signal processing would understand that the AGC signal for a television receiver is derived from the horizontal synchronization pulse. (See page 163 of the enclosed pages from the text by M. Kiver et al. entitled *Television Electronics, Theory and Service,* Dlelmar Publishers, Inc. 1983. As set forth in this text,

> The AGC circuit in a television receiver is more complex than the one in a radio receiver. The strength of a television video signals changes according to variations in the brightness of the scene being televised, but the height of the synchronizing pulses depends only on the strength of the RF signal. **For this reason, television receiver AGC circuits use the amplitude of the synchronizing pulses rather than the overall video signal to develop a DC control voltage.** This control voltage is then applied to the RF and IF amplifiers to reduce their gain when strong signals are received and to increase their gain for weak signals.

One of ordinary skill in the art would understand that the synchronization signals can be obtained only from the demodulated television signal. (See the section of the Kiver et al. text entitled "Video Detector." This section clearly indicates that the video detector of a television signal demodulates the television signal.

Furthermore, one of ordinary skill in the art would understand that the input signal to an NTSC Audio/Video Decoder is necessarily a demodulated television signal. As shown in Fig. 7.2 of the Kiver text, it is the output of the video detector (i.e. the demodulator) that is applied to the video amplifiers, the sound IF amplifiers, FM sound detector and audio amplifiers which, in this diagram constitute the NTSC Audio/Video Decoder. Thus, contrary to the assertion in the Office Action, one of ordinary skill in the art would understand that the Tuner 103 of Grabb et al. includes both the tuner and the demodulator and, thus, that the AGC input signal to Channel Measurement A/D of Grabb et al. is developed after the television signal has been demodulated.

As set forth in the previous response, it is because applicants measure the amplitude of the tuned television signal prior to the step of demodulating the tuned television signal that applicants are able to rapidly generate a channel map for a digital television transmission system, by determining only that a signal of sufficient strength exists at a respective channel position, rather than by tuning and recovering channel information at that channel frequency (see, for example, the specification at page 11, lines 3-6). As also stated, for example, in the specification, at page 7, lines 25-28, the invention advantageously "does not actually demodulate the DTV signals, when it builds the channel map. The process of building a channel map takes only a relatively short amount of time".

As set forth above, one of ordinary skill in the art would understand that the tuner of Grabb et al. necessarily includes the demodulator. Thus, one of ordinary skill in the art would understand that Grabb et al. does not meet the cited limitation of claims 1 and 6. Limberg discloses that the AGC voltage is developed from Baseband ATSC symbol code. (See Fig. 1). One of ordinary skill in the art would understand this as a demodulated television signal. Thus, Limberg does not provide the material that is missing from Grabb et al. Thus, claims 1 and 6 are not subject to rejection under 35 U.S.C. § 103(a) in view of Grabb et al. and Limberg. Claims 9 and 10 depend from claim 6 and are not subject to rejection under 35 U.S.C. § 103(a) in view of Grabb et al. and Limberg for at least the same reasons as claim 6.

Claims 2-5, 7 and 8 were rejected under 35 U.S.C. § 103(a) as being obvious in view of Grabb et al., Limberg and Henderson et al. This ground for rejection is respectfully traversed. As set forth above, neither Grabb et al. nor Limberg disclose or suggest, "measuring the amplitude of the tuned television signal prior to the step of demodulating the tuned television signal." Henderson et al. disclose an AGC circuit 27 following the IF circuit 9. As set forth at column 4, line 67 through column 5, line 3, "[t]he portions of the receiver shown in FIG. 1, with the exception of tuning system 23, are conventional and may therefore comprise corresponding

portions of a CTC-95 television chassis manufactured by RCA Corporation and described in detail in 'RCA Service Data, File 1978 C-7', hereby incorporated by reference." This passage indicates that the AGC circuit is a conventional AGC circuit and, thus, derives the AGC voltage from the synchronization pulses of the demodulated television signal. Accordingly, Henderson et al. do not provide the material that is missing from Grabb et al. and Limberg. Thus, claims 1 and 6 are not subject to rejection under 35 U.S.C. § 103(a) in view of Grabb et al., Limberg and Henderson et al. Claims 2-5 depend from claim 1 and claims 7 and 8 depend from claim 6. Consequently, these claims are not subject to rejection under 35 U.S.C. § 103(a) in view of Grabb et al., Limberg and Henderson et al. for at least the same reasons as their base claims.

The prior art references cited but not relied upon have been considered but do not affect the patentability of the invention.

In view of the foregoing remarks, Applicants request the Examiner to reconsider and withdraw the rejection of claims 1-10.

Respectfully submitted,

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KNN/
Attachments: Kiver et al. pp 162-164

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TELEVISION ELECTRONICS

THEORY AND SERVICE

MILTON KIVER • MILTON KAUFMAN

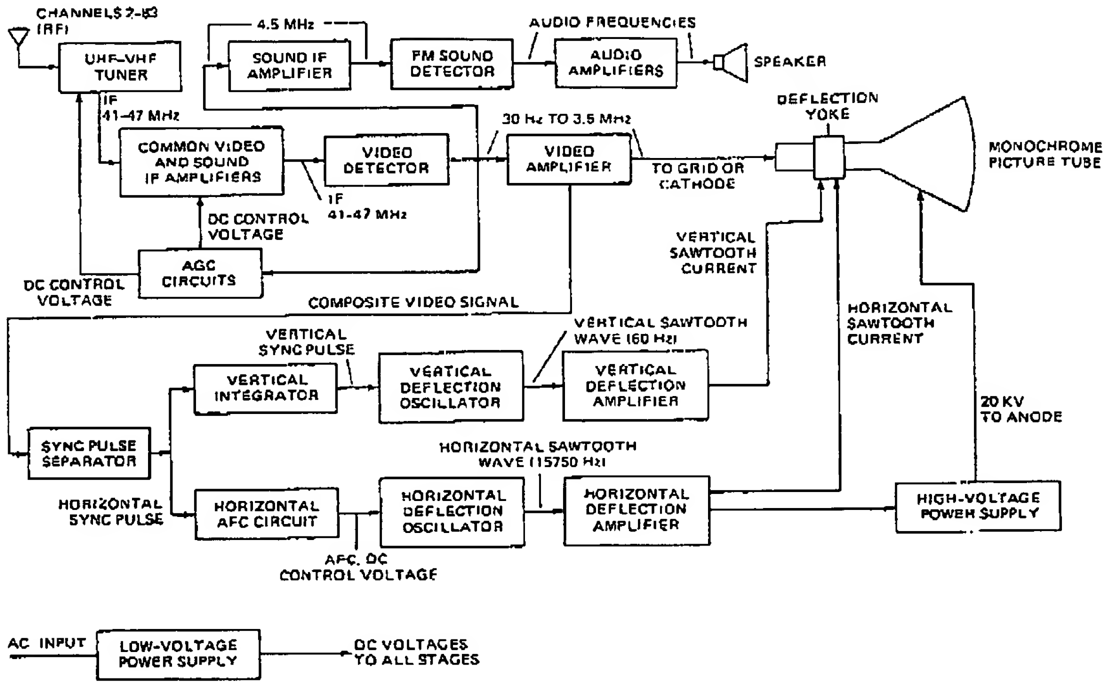

Figure 7.2 Simplified block diagram of a monochrome television receiver.

The UHF channel and oscillator signals heterodyne in the crystal mixer, whose usable output is in the IF range (41 to 47 MHz). Within this range (Figure 7.3) we have the picture IF carrier frequency of 45.75 MHz and the sound IF carrier frequency of 41.25 MHz. Note that the *fixed* difference between these two frequencies is 4.5 MHz. This 4.5-MHz frequency will be used as the FM sound IF frequency in later stages of the television receiver. The UHF tuner selects Channels 14 to 83 (470 to 890 MHz) either by the detent action of a rotary switch or by push buttons in more sophisticated receivers.

VHF Operation

The VHF tuner (in its normal VHF function) consists of an RF amplifier, mixer, and local oscillator. The RF amplifier increases the strength of the signal from the antenna. The gain of the RF amplifier is automatically controlled by a voltage from the automatic gain control (AGC) circuit. The RF amplifier also acts as a buffer to prevent undesirable coupling of the VHF oscillator signal to the antenna. The VHF tuner selects Channels 2 to 13 (54 to 216 MHz). Again, this is accomplished by detent action or push buttons. When VHF channels are being tuned, the UHF tuner is disabled.

As in the case of the UHF tuner, each VHF channel signal is heterodyned with the correct oscillator frequency in the mixer stage (transistor or vacuum tube). The usable mixer output for each channel is in the IF range, with the picture IF carrier frequency always 45.75 MHz and the sound IF

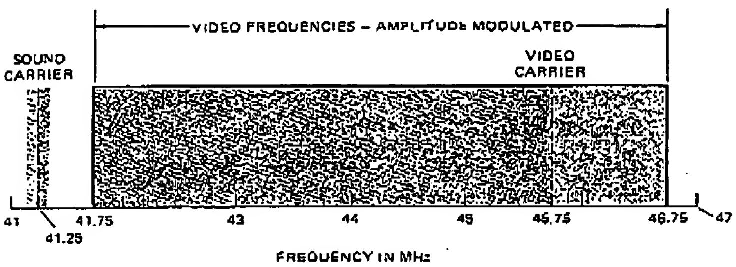

Figure 7.3 The distribution of sound and video IF frequencies.

carrier frequency always 41.25 MHz. Many receivers have a fine-tuning control associated with the tuner. This control permits limited manual adjustment of the oscillator frequency for best picture. With many other receivers, this is done automatically by AFT (automatic fine-tuning) circuits.

COMMON VIDEO AND SOUND IF AMPLIFIERS

Monochrome TV receivers may have two or three common IF amplifiers. Both the video and the sound IF frequency are passed by these amplifiers. This includes the video IF carrier and its sidebands plus the sound IF carrier and its sidebands. The required bandwidth may be obtained by "stagger-tuning" the frequencies of each IF amplifier. It may also be obtained by "broad-banding" when only two IF stages are used. The details of the IF response curve will be covered in Chapter 12. However, for the present, it is sufficient to say that the IF response is *not* flat over this range.

As shown in the block diagram of Figure 7.2, the gain of the common IF stages (and the tuner) is controlled by the AGC circuit. The voltage to operate this circuit originates at the output of the video detector. The AGC circuit varies the gain of these stages automatically, in accordance with the received signal strength. The output of the common IF stages is one or higher and is fed to the video detector.

AGC CIRCUITS

Superheterodyne AM radios use a volume control circuit to provide automatic adjustment of the output sound volume against variations in RF signal strength. In television receivers, a similar circuit is used but it is called **automatic gain control,** or **AGC.** The term *automatic volume control* is not appropriate for television because both the sound and the picture signal are stabilized against the signal strength changes by this circuit. The AGC circuit in a television receiver is more complex than the one in a radio receiver. The strength of a television video signal changes according to variations in the brightness of the scene being televised, but the height of the synchronizing pulses depends only on the strength of the RF signal. For this reason, television receiver AGC circuits use the amplitude of the synchronizing pulses rather than the overall video signal to develop a DC control voltage. This control voltage is then applied to the RF and IF amplifiers to reduce their gain when strong signals are received and to increase their gain for weak signals.

VIDEO DETECTOR

The output of the last common IF amplifier is coupled into the **video detector.** Here, the video carrier is heterodyned against its sidebands to provide different frequencies that constitute the original modu-

lating video frequencies, thus recovering the original video information. Also in the video detector, the video carrier is heterodyned against the sound carrier to produce the 4.5-MHz intercarrier sound IF frequency. The sound IF frequency is then applied to the sound IF amplifier, and the video signals are applied to the video amplifier. A portion of the video information is also fed into the AGC and sync-pulse separator circuits. As mentioned before, signal strength variations in the IF amplifiers are stabilized by feedback DC voltage from the AGC circuits. A portion of this AGC voltage is also used to adjust the signal output of the tuner.

Note: In color broadcasts and for color TV receivers, the output of the video detector will also contain a 3.58-MHz color subcarrier and its sidebands. This signal is fed to special color circuits. In monochrome receivers, however, the demodulated color signals are not permitted to pass through the video amplifier. This is done to avoid an interference pattern on the screen of monochrome receivers.

AUDIO SECTION

The FM sound signal is amplified in the 4.5-MHz sound IF amplifier and then fed into an FM detector. In some receivers, an FM discriminator is used as the FM detector. This circuit requires an additional stage, a limiter, to provide adequate noise reduction. Because of this, many receivers use a ratio detector or other single-stage detector. After detection, the sound signals are amplified to a level suitable for driving a loudspeaker.

VIDEO AMPLIFIER

Figure 7.2 shows that the detected picture signal is fed into the video amplifier. The polarity of this signal can be either positive or negative, depending on the particular type of picture detector used. This polarity is important because it, and the number of signal inversions during amplification, determine which element of the picture tube the amplified signal is applied to. Negative video output signals are connected to the picture tube control grid. (Positive signals go to the cathode.) Thus, a positive signal from a video detector, which is inverted one time in a single-stage video amplifier, is applied as a negative signal to the picture tube control grid. This signal can be made positive and then applied to the cathode by adding a second video amplifier. Most monochrome vacuum tube TV receivers have a single-stage video amplifier. Solid-state monochrome receivers usually have two video amplifier stages.

The basic function of the video amplifier is to provide sufficient drive signal to the picture tube. The signal must be capable of driving the tube from darkest black to brightest white. This will make it possible to reproduce all picture elements in their proper shades. The signal at this point, of course, is a composite video signal consisting of picture information and blanking and synchronizing pulses. The blanking pulses extinguish all retrace lines. The synchronizing pulses are not used at this point. A typical value of peak-to-peak video signal applied to the picture tube is about 100 V. The bandwidth of the video amplifier may vary from about 2.5 MHz to about 3.25 MHz.

SYNC-PULSE SEPARATOR

The sync-pulse separator removes the synchronizing pulses from the detected video signal, amplifies them to the proper level, and then feeds them into the vertical- and horizontal-deflection sections. These pulses keep the vertical and horizontal oscil-